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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.		
10/685,965	10/15/2003	David W. Bainbridge	1-28036	8637		
4859	7590	04/30/2008	EXAMINER			
MACMILLAN SOBANSKI & TODD, LLC ONE MARITIME PLAZA FIFTH FLOOR 720 WATER STREET TOLEDO, OH 43604-1619				VO, HAI		
ART UNIT		PAPER NUMBER				
1794						
MAIL DATE		DELIVERY MODE				
04/30/2008		PAPER				

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/685,965	BAINBRIDGE, DAVID W.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Hai Vo	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 07 February 2008.
- 2a) This action is **FINAL**.                  2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 39-71 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 39-71 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ .                                    |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ .  | 6) <input type="checkbox"/> Other: _____ .                        |

1. The art rejections over the patent application 09/684,470 in view of DVD disc "Lectro Engineering Company, MTM Systems" have been overcome in view of the present arguments. However, the 112 claim rejections and other art rejections are maintained.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 39-71 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Applicant makes clear that the most important aspect of the present invention is that the composite material made from a plurality of adhesive coated beads bound to each other through adhesive-to-adhesive bonds are critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). The adhesive-to-adhesive bonds effectively provide the composite material with higher impact resistance than bead-to-adhesive bondings and bead-to-bead bondings. Additionally, Applicant has discovered that the composite material made with electrical excitation zone treated beads exhibit five times the tensile strength of the composite material with untreated beads. Further, the electrical excitation zone treated beads are in combination with an adhesive to make the "subjective" composite material (page 10, lines 5-10 of the specification of the present invention). Accordingly, the

examiner maintained that the beads having electrical excitation zone treated surfaces and adhesive-to-adhesive bondings are critical or essential to the practice of the invention and thus need to be included in the claims.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 39-71 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 39 and 69 appear to be grammatically ambiguous so as not to clearly and accurately convey the spatial relationship of the claimed elements. The current phraseology is unclear as to how the beads and the adhesive are arranged. The scope becomes unclear since it is not determinable what structure can fall within the scope of the claim. Various interpretations, including some radically different arrangements are possible but do not seem within the scope of the disclosed invention. The claims do not preclude the composite material from having a substrate made from plurality of beads, each bound to each other, and an adhesive coating provided on the surface of the substrate. That does not fall within the scope of the present invention.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be

patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 69-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasahara et al (US 4,034,506) in view of DVD disc “Lectro Engineering Company, MTM Systems” and Frankel et al (US 5,252,657). Kasahara discloses a porous foam plate disposed on the surface of water contained in the casing comprising an aggregate of foamed polyethylene beads having a diameter 2 to 20 mm (column 2, line 66) within the claimed range. Kasahara discloses the foamed polyethylene beads being coated with a liquid adhesive that represents about 52 wt% of the foam plate (reference example, column 7, lines 5 and 11). Kasahara discloses the foamed beads being blended with a liquid adhesive (column 3, line 65 to column 4, lines 1-5). Likewise, the foamed beads would substantially have the entire surfaces coated with the liquid adhesive. The adhesive is made from a two-part thermoplastic resin or a two-part thermosetting resin (column 3, lines 25-60). Kasahara discloses a porous foam plate having a porosity of 37 volume percent and continuous open spaces among the adjacent beads, which reads on Applicant’s regular void distribution (column 7, lines 38, and abstract). Kasahara discloses the granular bead which reads on Applicant’s spherical shape (column 5, line 60). Kasahara does not disclose the ellipsoid shape of the bead. However, the bead has a diameter within the claimed range and it appears the shape is dictated by the bead diameter. Therefore, it is not seen that the bead of Kasahara could have a shape different than that of the

bead of the present invention. Kasahara does not disclose the inelastic or elastic properties of the bead. However, Kasahara uses the same material to form a bead as Applicant, i.e., polyethylene or polystyrene, it is the examiner's position that the inelastic or elastic properties should be inherently present. Like material has like property. This is in line with *In re Spada*, 15 USPQ 2d 1655 (1990) which holds that products of identical chemical composition can not have mutually exclusive properties. Kasahara discloses that the adhesive is cured from a liquid state while in initial contact with the beads. Kasahara discloses the liquid adhesive having a viscosity of about 3 to 1000 cps at 20°C and solid content of 20 to 60 wt% based on the total weight of the adhesive (column 3, lines 5-10). Kasahara does not specifically disclose the hardness of the adhesive. Frankel, however, teaches an acrylic emulsion being useful as an adhesive (column 15, lines 25-26) and having a viscosity of about 3 to 1000 cps and solid content of 20 to 60 wt% based on the total weight of the adhesive. Frankel discloses that the adhesive having a shore A hardness of 25 within the claimed range (table V, example 15). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the adhesive having a hardness as described by Frankel as the adhesive of Kasahara motivated by the desire to provide a porous foamed plate with improved toughness and tensile strength.

Kasahara does not specifically disclose the beads being treated with plasma prior to adhesive coating. A DVD disc "Lectro Engineering Company,

"MTM Systems" shows that the powdered material having a surface treated with plasma discharge to provide an increase in the surface energy of the material, thereby enhancing adhesive strength of the material. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the surface of the polyethylene beads treated with the plasma discharge prior to the adhesive coating motivated by the desire to provide an increase in the surface energy of the beads, thereby enhancing adhesive strength between the adhesive and the beads.

Kasahara as modified by DVD and Frankel does not specifically disclose that the beads are electrical excitation treated more than once to accomplish more than one kind of treatment. However, it is a product-by-process limitation not as yet shown to produce a patentably distinct article. It is the examiner's position that the foam plate of Kasahara as modified by DVD is identical to or only slightly different than the claimed composite structure prepared by the method of the claim, because both articles are formed from the same materials, having structural similarity as discussed above. It is noted that if the applicant intends to rely on Examples in the specification or in a submitted Declaration to show non-obviousness, the applicant should clearly state how the Examples of the present invention are commensurate in scope with the claims and how the Comparative Examples are commensurate in scope with Kasahara/DVD/Frankel.

8. Claims 39, 40, 43, 45-48, 53, 54, 56-61, and 63-68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasahara et al (US 4,034,506) in view

of Frankel et al (US 5,252,657). Kasahara discloses a porous foam plate disposed on the surface of water contained in the casing comprising an aggregate of foamed polyethylene beads having a diameter 2 to 20 mm (column 2, line 66) within the claimed range. Kasahara discloses the foamed polyethylene beads being coated with a liquid adhesive that represents about 52 wt% of the foam plate (reference example, column 7, lines 5 and 11). Kasahara discloses the foamed beads being blended with a liquid adhesive (column 3, line 65 to column 4, lines 1-5). Likewise, the foamed beads would substantially have the entire surfaces coated with the liquid adhesive. The adhesive is made from a two-part thermoplastic resin or a two-part thermosetting resin (column 3, lines 25-60). Kasahara discloses a porous foam plate having a porosity of 37 volume percent and continuous open spaces among the adjacent beads, which reads on Applicant's regular void distribution (column 7, lines 38, and abstract). Kasahara discloses the granular bead which reads on Applicant's spherical shape (column 5, line 60). Kasahara does not disclose the ellipsoid shape of the bead. However, the bead has a diameter within the claimed range and it appears the shape is dictated by the bead diameter. Therefore, it is not seen that the bead of Kasahara could have a shape different than that of the bead of the present invention. Kasahara does not disclose the inelastic or elastic properties of the bead. However, Kasahara uses the same material to form a bead as Applicant, i.e., polyethylene or polystyrene, it is the examiner's position that the inelastic or elastic properties should be inherently present. Like material has like property.

This is also in line with *In re Spada*, 15 USPQ 2d 1655 (1990). Kasahara discloses that the adhesive is cured from a liquid state while in initial contact with the beads. Kasahara discloses the liquid adhesive having a viscosity of about 3 to 1000 cps at 20°C and solid content of 20 to 60 wt% based on the total weight of the adhesive (column 3, lines 5-10). Kasahara does not specifically disclose the hardness of the adhesive. Frankel, however, teaches an acrylic emulsion being useful as an adhesive (column 15, lines 25-26) and having a viscosity of about 3 to 1000 cps and solid content of 20 to 60 wt% based on the total weight of the adhesive. Frankel discloses that the adhesive having a shore A hardness of 25 within the claimed range (table V, example 15). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the adhesive having a hardness as described by Frankel as the adhesive of Kasahara motivated by the desire to provide a porous foamed plate with improved toughness and tensile strength.

The preamble “construction material”, “padding material” have not given patentable weight because it has been held that a preamble is denied the effect of a limitation where the claim is drawn to a structure and the portion of the claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause. *Kropa v. Robie*, 88 USPQ 478 (CCPA 1951).

Kasahara does not specifically disclose the porous foam plate being placed in a cloth casing or in a net casing. The examiner takes Official Notice

that it is common and well known in the hydroponics art to use the porous foam plate in combination with a cloth casing or a net casing. As such, it would have been obvious to a person having ordinary skill in the art to place the porous foam plate in the cloth casing or in the net casing because the cloth or the net is sufficiently permeable to water and air, exerts no harmful influence on the growth of the plants.

9. Claims 41, 42, 49, 50 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasahara et al (US 4,034,506) in view of Frankel et al (US 5,252,657) as applied to claim 39 above, further in view of Shannon et al (US 4,777,763). Kasahara does not specifically disclose the beads formed from hollow ceramics or glass. Shannon, however, teaches a plant growing board for use in hydroponic gardening comprising polyethylene hollow beads, glass, clay hollow beads blended with the fibers to enable the board to float (column 8, lines 25-30). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the glass or clay hollow beads in combination with the polyethylene beads because such is an intended use of the material and Shannon provides necessary details to practice the invention of Kasahara.
10. Claims 44 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasahara et al (US 4,034,506) in view of Frankel et al (US 5,252,657) as applied to claim 39 above, further in view of Schwab et al (US 3,877,172). Kasahara does not specifically disclose the beads formed from a thermosetting

material. Schwab, however, teaches a foamed plastic profile member for hydroponic cultivation comprising a plurality of foam pieces held together by a foamed binder as shown in figure 8. Schwab teaches the foam pieces made from a polyurethane, polystyrene and urea formaldehyde (column 5, lines 35-40). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the thermosetting material for the thermoplastic material to form the beads because two foam materials have been shown in the art to be recognized equivalent materials for use in the hydroponic cultivation and growth of plants.

11. Claims 51 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasahara et al (US 4,034,506) in view of Frankel et al (US 5,252,657) as applied to claim 39 above, further in view of Tully et al (US 3,710,510). Kasahara does not specifically disclose the bead being coated with a coupling agent comprising silane as disclosed in the specification. Tully, however, teaches a plant growth media comprising expanded clays with a variety of particle sizes and coated with silane to render hydrophobic so as to sustain growth of young seedlings and to provide maximum opportunity for development of root system (column 2, lines 20-32, column 5, lines 10-30). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use expanded clays with a variety of particle sizes and coated with silane to render hydrophobic so as to sustain growth of young seedlings and to provide maximum opportunity for development of root system.

***Response to Arguments***

12. The art rejections based on Kasahara have been maintained for the following reasons. Applicant contends that improved toughness and tensile strength of the Kasahara foam plate would result in a structure that is unsuitable for use in the hydroponics. The examiner respectfully disagrees. Applicant's attention is directed to Shannon et al (US 4,777,630), Minoji (US 5,921,024) and JP 63-145362. All three references are related to a plant growing medium having excellent compressive strength and exhibiting excellent root growth. Likewise, it is clearly apparent that an increase in toughness and tensile strength would provide the foam plate with firm supportability for the hydroponics and such would certainly not impair the unhindered root growth and imbibition of nutrient solution. Therefore, the combined teachings of Kasahara and Frankel are proper and establish a *prima facie* case of obviousness.

Applicant argues that an increase in the adhesive strength of the beads that forms the Kasahara foam plate would defeat the hydroponic purposes. Again, the arguments are not found persuasive for patentability because neither experimental data nor factual evidence has been provided to support his assertions. The increased adhesion strength would make the foam plate with sufficient strength suitable for use in support of hydroponic cultivation as evidenced by Shannon et al (US 4,777,630), Minoji (US 5,921,024) and JP 63-145362. Applicant further contends that the DVD reference is related to the surface treatment of an article. Applicant adds that the combined teachings of

Kasahara and the DVD reference do not suggest the plurality of beads with treated surfaces, but rather result in a foamed plate having an outer surface that is subjected to the surface treatment. The arguments are not found convincing for patentability for the following reasons. The foam plate itself is made of the plurality of beads, it is not seen why the beads could not have surfaces being treated as the foam plate is subjected to the surface treatment. Accordingly, the art rejections are sustained.

***Conclusion***

**13. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai Vo whose telephone number is (571)

272-1485. The examiner can normally be reached on Monday through Thursday, from 9:00 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on (571) 272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Hai Vo/  
Hai Vo  
Primary Examiner, Art Unit 1794